

WHAT IS CLAIMED IS:

1. A beverage bottling plant for filling bottles with a liquid beverage filling material, said beverage bottling plant comprising:

a cleaning station being configured and disposed to clean bottles;

a first conveyer arrangement being configured and disposed to convey bottles to said cleaning station;

an inspection station being configured and disposed to inspect cleaned bottles;

said inspection station comprising at least a first inspection structure and a second inspection structure separate from said first inspection structure;

a second conveyer arrangement being configured and disposed to convey cleaned bottles from said cleaning station to said inspection station;

a filling machine being configured to fill cleaned and inspected bottles with liquid beverage filling material;

said beverage filling machine comprising a plurality of beverage filling positions, each beverage filling position comprising a beverage filling device for filling bottles with liquid beverage filling material;

said filling devices comprising apparatus being configured to introduce a predetermined flow of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material;

said apparatus being configured to introduce a predetermined flow of liquid beverage filling material comprising apparatus being configured to terminate the filling of beverage bottles upon liquid

beverage filling material reaching said substantially predetermined level in bottles;

a third conveyer arrangement being configured and disposed to move inspected bottles from said inspection machine to said filling machine;

a closing station being configured to close filled bottles;

a fourth conveyer arrangement being configured and disposed to transfer filled bottles from said filling machine to said closing station;

a packaging station being configured to package a plurality of bottles into single containers;

a fifth conveyor arrangement being configured and disposed to transfer closed, filled bottles from said closing station to said packaging station;

a handle-attaching station being configured and disposed to attach carrying handles to said containers;

a sixth conveyor arrangement being configured and disposed to transfer said containers to and through said handle-attaching station;

said handle-attaching station comprising an attaching mechanism to attach said carrying handles to said containers;

said attaching mechanism comprising an applicator head configured and disposed to dispense and attach strips of material to said containers to form said carrying handles;

said attaching mechanism comprising an X-Y-positioning unit;

said applicator head being connected to and disposed at an end of said X-Y-positioning unit to permit said applicator head to contact said containers to attach said carrying handles;

said X-Y-positioning unit being configured and disposed to move

said applicator head about said containers to permit said applicator head to attach a first end of said carrying handles to a first surface of said containers and to attach a second end of said carrying handles to a second surface of said containers; and

a computer control device being configured and disposed to control the movement of said X-Y-positioning unit according to a movement program.

2. The beverage bottling plant according to Claim 1, wherein: said sixth conveyor arrangement is configured and disposed to transport said containers through said handle-attaching station in a spaced apart manner; and

said applicator head is configured to be moved by said X-Y-positioning unit downwardly into and upwardly out of the space between each of said containers to permit attachment of said carrying handles.

3. The beverage bottling plant according to Claim 2, wherein said X-Y-positioning unit comprises flexible pulling elements.

4. The beverage bottling plant according to Claim 3, wherein said applicator head comprises a sensor that senses the distance of an approaching container.

5. The beverage bottling plant according to Claim 4, wherein said applicator head comprises at least one device for applying liquid adhesives or hot-liquid adhesives to said containers.

6. The beverage bottling plant according to Claim 5, wherein said at least one device for applying liquid or hot-liquid adhesives is configured to be swung about at least one axis by way of a drive arrangement having a control arrangement.

7. The beverage bottling plant according to Claim 5, wherein said applicator head comprises a cutting arrangement configured and disposed to cut said strips of material to form said carrying handles.

8. The beverage bottling plant according to Claim 5, wherein: said applicator head comprises a gripper device configured and disposed to grip said carrying handles for attachment on said containers; and

said space between two adjacent containers on said sixth conveyor arrangement upon movement through said handle-attaching station is less than 180 mm.

9. Apparatus for attaching carrying grips of any desired material at containers of any desired type, characterized in that an applicator head (4) is disposed at an X-Y-positioning unit (8).

10. Apparatus according to the introductory portion of claim 9, characterized in that the applicator head (4) can be moved by the X-Y-positioning unit (8) downwardly into and out of the space between containers (3) that can be spaced apart from one another.

11. Apparatus according to claim 9 or 10, characterized in that the X-Y-positioning unit is a device that utilizes flexible pulling elements.

12. Apparatus according to one of claims 9 to 12, characterized in that the applicator head (4) comprises a sensor that senses the distance of the succeeding container (3).

13. Apparatus according to one of the preceding claims, characterized in that the applicator head (4) comprises at least one device for applying liquid adhesives or hot-liquid adhesives.

14. Apparatus according to claim 13, characterized in that the

device for applying liquid or hot-liquid adhesives is configured to be swung about at least one axis by way of a drive arrangement having a control arrangement.

15. Apparatus according to one of claims 9 to 13, characterized in that the applicator head (4) comprises a cutting arrangement (6).

16. Apparatus according to one of claims 9 to 15, characterized in that the applicator head (4) comprises a gripper device (7).

17. Apparatus according to one of claims 9 to 16, characterized in that the gap between two containers that are being processed is less than 180 mm.

18. Method of attaching carrying grips of any desired material at containers of any desired type, characterized in that an applicator head moves into the space between two containers (3), attaches the carrying grip at the first side of the container, moves above the upper side of the container to the back side thereof, whereby the length of the carrying grip is determined by the distance that the applicator head (4) is away from the upper side of the container, and subsequently attaches the carrying grip at the back side of the container (3).

19. Method according to claim 18, characterized in that the required quantity of adhesive for attaching the carrying grip is applied by at least one adhesive spray dispenser that is disposed at the applicator head (4).

20. A method of operating a beverage bottling plant for filling bottles with a liquid beverage filling material, said beverage bottling plant comprising: a cleaning station being configured and disposed to clean bottles; a first conveyer arrangement being configured and

disposed to convey bottles to said cleaning station; an inspection station being configured and disposed to inspect cleaned bottles; said inspection station comprising at least a first inspection structure and a second inspection structure separate from said first inspection structure; a second conveyer arrangement being configured and disposed to convey cleaned bottles from said cleaning station to said inspection station; a filling machine being configured to fill cleaned and inspected bottles with liquid beverage filling material; said beverage filling machine comprising a plurality of beverage filling positions, each beverage filling position comprising a beverage filling device for filling bottles with liquid beverage filling material; said filling devices comprising apparatus being configured to introduce a predetermined flow of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material; said apparatus being configured to introduce a predetermined flow of liquid beverage filling material comprising apparatus being configured to terminate the filling of beverage bottles upon liquid beverage filling material reaching said substantially predetermined level in bottles; a third conveyer arrangement being configured and disposed to move inspected bottles from said inspection machine to said filling machine; a closing station being configured to close filled bottles; a fourth conveyer arrangement being configured and disposed to transfer filled bottles from said filling machine to said closing station; a packaging station being configured to package a plurality of bottles into single containers; a fifth conveyor arrangement being configured and disposed to transfer closed, filled bottles from said closing station to said packaging

station; a handle-attaching station being configured and disposed to attach carrying handles to said containers; a sixth conveyor arrangement being configured and disposed to transfer said containers to and through said handle-attaching station; said handle-attaching station comprising an attaching mechanism to attach said carrying handles to said containers; said attaching mechanism comprising an applicator head configured and disposed to dispense and attach strips of material to said containers to form said carrying handles; said attaching mechanism comprising an X-Y-positioning unit; said applicator head being connected to and disposed at an end of said X-Y-positioning unit to permit said applicator head to contact said containers to attach said carrying handles; said X-Y-positioning unit being configured and disposed to move said applicator head about said containers to permit said applicator head to attach a first end of said carrying handles to a first surface of said containers and to attach a second end of said carrying handles to a second surface of said containers; and a computer control device being configured and disposed to control the movement of said X-Y-positioning unit according to a movement program, said method comprising the steps of:

- transporting said bottles with said first conveyer arrangement to said cleaning station;

- cleaning said bottles at said cleaning station;

- transporting said bottles with said second conveyer arrangement from said cleaning station to said inspection station;

- inspecting said bottles at said inspection station;

- transporting said bottles with said third conveyer arrangement

from said inspection station to said filling machine;

filling said bottles with said filling machine with liquid beverage filling material;

transporting said bottles with said fourth conveyer arrangement from said filling machine to said closing station;

closing said bottles at said closing station;

transporting said bottles with said fifth conveyer arrangement from said closing station to said packaging station;

packaging pluralities of bottles into containers at said packaging station;

transporting said containers with said sixth conveyer arrangement from said packaging station to said handle-attaching station; and

attaching carrying handles to said containers with said attaching mechanism; and

said step of attaching carrying handles comprising the steps of:

moving said applicator head with said X-Y-positioning unit adjacent a first side of a first container;

attaching a first end of a carrying handle to said first side of said first container;

moving said applicator head with said X-Y-positioning unit above an upper side of said first container and to a second side of said first container opposite said first side, wherein the length of said carrying handle is determined by the distance that said applicator head is positioned away from said upper side of said first container;

moving said applicator head with said X-Y-positioning unit into a space between said first container and a second,

successive, adjacent container;

attaching a second end of said carrying handle to said second side of said first container; and

repeating said steps for said second container and each successive container to attach carrying handles to said containers.